

ciently acquainted with foreign authors," he ought at least to be so with British ones, ere he sets up a claim for such familiar discoveries as the phosphorescence of zoophytes. The 'Dictionnaire des Sciences Naturelles' refers to British authors, and rather old ones too (as Shaw), on the very subject in dispute.

But I have another "Retrospective Comment" for Mr. Hassall, on a passage in his paper on Diseases produced by Fungi, in the last Number of the 'Annals.' He there writes—"The production of diseases through the agency of Fungi, whether in the animal or vegetable fabric, has not hitherto received that degree of consideration to which the frequency of their occurrence and the importance of the subject so eminently entitle them;" and again, "it has hitherto been supposed that their powers were confined to dead organic matter." Who would suppose from this, that only a year ago an elaborate memoir "On the Parasitic Vegetable Structures found growing in Living Animals" had been published in the Transactions of one of the Royal Societies of Great Britain (see Edin. Royal Soc. Transact., vol. xv. part 2. for a paper eighteen pages long, with two plates, by my friend Dr. J. H. Bennett)? Yet such was the case, and nearly fifty authors on the subject in question are referred to in that paper.

August 1843.

XXVII.—*Information respecting Scientific Travellers.*

[A NEWLY published Part of the 'Journal of the Royal Geographical Society' contains two narratives of an expedition to the Barima and Guiana Rivers, communicated by our esteemed correspondent the Chevalier Schomburgk* to the Colonial Office, from which we shall give some extracts relating to natural history.—Ed.]

River Manari (a tributary of the Barima),
June 22, 1841.

The expedition under my direction left Georgetown on the afternoon of the 19th of April, in the schooner Home, which had been chartered for the purpose of conveying us to the Waini, or Guiana.

On the 28th of April we received the visit of a Warran chieftain from the Canyaballi, a tributary of the Waini, and about two days' journey from its mouth, who, having heard of our arrival, came with part of his men to visit us. The captain is known among the colonists of this part under the name of Sam Peter, and appeared a very intelligent old man. During the time occupied by the survey the weather had changed, and it now became apparent that the short rainy season had set in. We ascended the Waini to the remarkable passage which connects that river with the Barima; and which, although not navigable for sailing vessels, affords a ready communication, in boats and canoes, between the two rivers. This natural

* See also the notice in vol. x. p. 348.

channel may be compared, in some respects, to the Cassiquiare, which connects the Upper Orinoco with the Rio Negro, and it is known in the colony under the name of the Mora Creek. The Warran Indians, who inhabit these rivers, call it Morawan.

The Barima presented, where we entered it from the Mora, the appearance of a much larger river than I had expected. I estimated its breadth at 700 feet. Its water, still subject to the influence of the tides, was of a dark colour, and its depth from eighteen to twenty-four feet. About five miles from the junction of the Mora, the river Aruka flows into the Barima on its left bank. The two rivers, before they unite, are nearly of equal breadth—about 400 feet each. The Aruka has yellowish muddy water. A few houses, inhabited by Warran Indians, are within a short distance of the confluence of the Aruka with the Barima. They, with others who inhabit the Lower Aruka, acknowledge a Warran by the name of William as their chieftain, who resides at the small brook Atopani.

We followed Mr. King to the Warran settlement Cumaka, which is within a short distance of Atopani, and landed there in the evening. We found a large assemblage of Warrans, with their chieftain William. The Indians were suffering, to an extent painful to behold, from ophthalmia. My previous excursions have made me acquainted with various tribes who inhabit British Guiana or the adjacent territories; but though that disease is by no means unusual among them, I nowhere saw it so frightfully exhibited as here, where at least 50 per cent. of the inhabitants are labouring under it, or have had their eyesight impaired by it. I ascribe it to their inhabiting the low marshy grounds, where it appears they are more subject to colds than in the open savannahs or on the high mountains, and to carelessness.

Cumaka is situated on rising ground. These hillocks, which are the first high ground from the sea inland, form a small chain that extends in a western direction: they are composed of indurated clay, highly ochreous; and, to judge from their vegetation, and the provision-grounds of the Indians on their declivities, the soil is fertile. It is only here that the vegetation of the banks on the river begins to change. Hitherto it consisted of curida and mangrove trees, and numerous manicole palms; but when we had reached the rising ground, we observed noble forest-trees—as, for example, the crab-nut tree, useful for building material; locust, curaliara, siruaballia, soriari, and others. From the curaliara the Warrans prepare canoes and corials; and from the size of these I judge of the height of the trees from which they are made.

I resolved, as soon as the general health of my crew was restored, to proceed to the mouth of the Barima for the purpose of examining that part of the river. I engaged six Warran Indians, under the command of the chieftain's son, to accompany us, and we set out on our journey on the 10th of May; and having paddled through the greater part of the night, we landed the following day at the mouth of the Barima, where we encamped not far from Point Barima, on the right bank of the river.

The survey of the Barima was finished by the 19th of May. Its

banks are marshy to its junction with the Aruka; and so much subjected to the tide, that we could not find any spot fit for our night-quarters. It would cost the same labour and expense to bring the lower tracts into cultivation that were required to render the coast land of Demerara arable and productive. Of the upper regions, which I have not yet visited, I can say nothing.

The fish known under the name of querrunai in the colony abounds in these estuaries, and its value is acknowledged, as one in its dry state brings in the market of Georgetown from five to six *bits* (1*s.* 9*d.* to 2*s.* 3*d.*). Of equal, if not greater value, is the morocotto, which frequents the rivers that fall into the Orinoco, and weighs when taken from 10 to 12 lbs. I consider it of importance to point out every resource that the country possesses. These fisheries, if followed up in a proper manner, would no doubt become a useful branch of internal commerce.

We left the mouth of the river Barima on the 20th of May, and arrived at Cumaka, which we had selected as our depôt, on the following day.

Thirteen miles from Cumaka, in a southern direction, the Aruka is joined by the Aruau, by means of which the portage is reached which forms the communication between the rivers Aruka and Amacura. I resolved, however, to follow the Aruka some distance beyond the junction, in order to visit a Warran settlement, and to become acquainted with the character of the upper course of that river. It decreases materially in size, being scarcely more than thirty yards across; its banks, still swampy, are studded with manicole and truti palms, along the stems of which we saw the aromatic vanilla trailing in large quantities, forming natural festoons, and its numerous white flowers diffusing a delicious perfume. The water of the river was of a jet-black, and so clear, that it was difficult to detect where the reflected image, which the trees and shrubs bordering its banks cast into the river, separated from the real object.

We returned next morning to the junction of the Aruau with the Aruka, and, following the former river upwards, reached in the evening the portage, whence we had to transport the corial to one of the rivulets which flow into the Amacura.

The soil consisted of rich loam; and I observed several trees useful for naval and civil architecture, as the crab-wood, siruadallia, soriari, mora, and many others. One of the mora-trees astonished me by its gigantic size.

The botanist would have been here much delighted by a diversified and interesting flora. Orchideous plants, the *Peristeria* (or flower of the Holy Spirit); several *Epidendra*, with scarlet blossoms; and many others of equal interest, adorned the trees. A *Crucian* with white flowers and a delicious perfume bordered the banks; *Bigoniaceæ* trailed along the trees; and the *Brounea racemosa*, which has been compared to our rose, added to the variety by its bright scarlet colour, especially when contrasted with the green of the surrounding shrubs and trees.

We ascended it, in order to pay a visit to Assecura, a settlement

of Arawaaks and Warrans, under the Arawaak chieftain Jan. We were received in a very friendly manner ; and found in him an intelligent man, who spoke the Creol-Dutch perfectly. The settlement consisted mostly of Arawaaks, and only a few Warrans. The greater cleanliness in person of the former, compared with the latter, was striking. We did not observe among any of the Arawaaks (whether children or adults) those tumours which are caused by an accumulation of chigoes, and which, being neglected to be extracted in time, render many of the Warran children lame ; indeed, as the chigoes penetrate other parts as well as the feet, these poor children not only suffer the greatest pain by the neglect of their parents, but are rendered in their appearance positively offensive. This was not the case with the Arawaaks, among whom the filthy state of the Warrans is proverbial ; nor did they suffer from those ophthalmic complaints, which I have mentioned as being so common to the Warrans of these rivers, and of which the extent has been under-rated in the statements that even fifty per cent. of them suffer under it.

With Captain Jan of Assecura as a guide, and our crew increased by several of his followers, we left the settlement on the 2nd of June, and now ascended the Amacura.

The next day (June 3rd) proved so rainy that we were obliged to remain stationary. We started, however, on the 4th of June, to continue the survey of the Amacura to its falls or rapids, which are caused by a ledge of granitic rocks that cross the river and impede its farther navigation.

As we advanced I found its banks increase in height, and become studded with noble forest-trees. The gorgeous flowers of the *Brownea racemosa* and *Gustavia angustifolia* were so abundant that they added considerably to the beauty of the sylvan scenery.

We left on the 7th of June, on our farther descent to the mouth of Amacura. The Arawaak, Captain Jan, who went with us to the Upper Amacura, and who proved himself very useful and intelligent, accompanied us farther, as his knowledge of the localities, and the names of streams which fall into the Amacura, rendered his services valuable. The streams which join the river from its eastern or right bank are very numerous ; and it increases materially in breadth : I state its average depth at its lower course as eighteen feet, though there are places which much exceed that depth. A peculiar feature in this river are large patches, consisting of matted grass, the splendid blue water-lily (*Ponthederia azurea*), and several other water-plants, which, torn off by the increased stream during the rainy season, come floating down with the current, and reaching that part of the river where it is subjected to the tides, are carried to and fro, as the tide may be flowing or falling. We might have numbered thousands of these little floating islands. We reached, in the afternoon at three o'clock, the Coyuni, which, like the Mora from the Waini to the Barima, and *vice versa*, offers an uninterrupted passage in canoes from the Amacura to the Araturi. The Coyuni connects the Amacura with the Waicaicaru or Bassama, which falls into the Araturi.

This river flows, opposite the island Smataca, into the Orinoco, and is another instance of a remarkable connexion between the tidal rivers of this coast.

There is no doubt that the Amacura is navigable for smaller vessels and steamers to the Yarikita; the bar at its mouth, and the inconsiderable breadth, which seldom amounts to more than 300 yards, render it unfit for larger vessels. It abounds in that delicious fish morocotto.

It was late in the evening before we reached the mouth of the Amacura. We arrived on the 10th of June at Cumaka, where, to my great satisfaction, I found the invalids mostly restored, and Mr. Superintendent King rejoicing in his recovered eyesight.

Although the rainy season has for some time past set in, and although our stores are materially reduced, and we have been deprived of many comforts, I yet deem it my duty to persevere, and continue the survey to the Cuyuni.

Demerara, August 1841.

The party under my command left Cumaka, where we had sojourned for some time, on the 15th of June, and having arrived at the junction of the Aruka with the Barima, we continued the ascent of the latter river in an east-south-eastern direction: we reached, next day, its junction with the Kaituma, which falls in on the left bank from the S., and is at its mouth about 200 feet wide. The Kaituma is inhabited by Warran and Waika Indians, and is connected with the Upper Barima by several intermediate brooks.

Numerous rivulets join the Barima on both its banks; some of them inhabited by Warrans. It has still, however, the appearance of a tidal river, being margined by mangrove and curida bushes, over which manicole and truli palms raise their heads. Its banks form continued swamps, which only can be made arable through the industry of man.

I always considered it my duty, wherever an opportunity offered, to observe how far the geological structure of the country might be favourable to cultivation; it being undeniable that the quality of the soil depends generally upon the rocks which form the strata below the arable land. The superstrata at the hills of Warina consist of ochreous clay, intermixed with mould, pebbles, and that due proportion of sand which would particularly qualify it for the cultivation of coffee. The large blocks of ferruginous clay which lie dispersed on the surface ensure the necessary moisture for the cultivation of that plant; for it is well known to the agriculturists how beneficially such blocks operate on the soil on which they lie, contributing not only to the retention of moisture, which would otherwise evaporate, but to the precipitation of atmospheric vapours.

Since we had left Warina, our course up the Barima lay more to the S.W.: the banks of the rivers became higher; while the palms and mangrove bushes, which till now had been so numerous, became less frequent, and were replaced by a more varied vegetation. Our Indian guides informed us that, by ascending the rivulet Yarumuku

half a day, we should reach high hills and savannahs. We continued, however, the ascent of the Barima, and passed the rivulets Aruta and Pegua; the latter inhabited by Warrans.

In lieu of palms, the most stately mora-trees overshadowed the river. In all my former travels in Guiana I have nowhere seen trees of this description so gigantic as on the land adjoining the Barima at its upper course. Indeed, frequently, when our boat rounded some point which the river made in its course, and a long reach was before us, these majestic trees appeared in the background as hillocks clothed with vegetation, until a nearer approach showed our mistake; and we found that what we considered to have been a hillock was a single tree, rising to the enormous height of 130 to 150 feet; forming by itself, as it were, a forest of vegetation. The importance of the mora in naval architecture is now fully recognised in Great Britain, and a new export trade has been opened to the colony. On the Upper Barima this tree is so abundant, and grows to such a size, that the whole British navy might be reconstructed merely from the trees which line its banks; a circumstance well worth consideration, for the river being navigable to vessels of twelve feet draught, the craft intended for the transport of the timber might load at the very spot where the trees are cut down. It is only lately that the timber of Guiana has come into notice in England; but so superior is the mora and the green-heart for objects of naval architecture, that a higher price is given for them in seaport towns than for any other wood imported into England.

I was anxious to examine the Barima beyond its falls. I started accordingly, on the 24th of June, in a small canoe, accompanied by Mr. Glascott, the assistant-surveyor, and Mr. Echlin, the artist of the expedition. Descending the Manari for a short distance, we reached the Barima by two of those natural canals (the Gaima and Ataima) which so frequently connect rivers having a parallel course in these swampy regions. The almost continual torrents of rain had caused the Barima to overflow its banks, and we found the current running at the rate of from four to four and a half miles an hour. Our progress was consequently slow. A short distance above the off-flow which connects the Barima and Manari, we visited a Warran settlement called Emu, where we admired a gigantic bamboo, several hundred yards in circumference.

We found two of the Indians finishing a native canoe, which they had cut out of cedar (*Icica altissima*), a species of wood uncommonly well qualified for that purpose, and resembling, in its durability, odour, and reddish colour, the famed Bermuda cedar, although a genus quite distinct from the icica. As the cedar-tree of Guiana is by no means scarce, it deserves more attention.

We were accompanied by a number of Indians from Simuita and the neighbouring settlements, who intended to ascend the river to the falls, to shoot the delicious fish called maracotto, or ossibu, which, at the time these waters are full, migrate beyond the falls for the purpose of depositing their spawn. We formed a flotilla of boats, our canoe being the leading frigate. Several fish were procured on

the first day. In order to attract them to the shore, a number of the seeds of the carapa, or crab-nut, are pounded, and having been enclosed in a netting of withes, they are put in the water, and soon attract the greedy maracotto. An Indian stands ready with a light spear, which he lances into them, one after another, with unerring aim. The maracotto frequently attains a length of thirty inches, and is twenty-six inches in girth. Its flavour is delicious.

I now found it advisable to discontinue the ascent in corials, for numerous trees which had fallen across the Barima obstructed the boats. Leaving Mr. Glascott in charge of the camp formed at the junction of the two rivers, and having armed the most effective of the crew with cutlasses and axes, we cut our way through entangled bushes and swamps, following the left bank of the Barima. With the exception of two rivulets, we found the tributaries which the river received of inconsiderable size. Its bed is frequently traversed by granitic dikes, over which the water precipitated itself impetuously; and its current was so rapid that it would have been difficult to make any way in ascending, even in a small corial.

I admired the number of noble forest-trees, among which I observed the bullet-tree, the locust-tree, the crab-wood, curahara, itapu, cuyama, yarura, and its allied species, parnacussana; the suari or impa, and makaratalli. But the most remarkable appeared to me the tunkara, which measured in circumference from twenty-eight to thirty feet. Its trunk rose free from branches, smooth and round, to about seventy or eighty feet; and I was told by some of my Indian guides that the Warrans used the tree for making canoes. It is soft and white, and the colonists prepare staves from it. The Warrans make their bark or shell canoes of the bark of the bullet-tree and makaratalli.

We were joined by a number of Warrans and several Waikas from Manari, whose services we had engaged to assist in carrying our luggage from Manari to the Barama, which flows into the Waini. We were told that we should have to ascend the Barama in boats for four days before we could reach the path that leads to the Cuyuni.

An Indian carries scarcely more than 24 lbs. weight on journeys overland. While the negro carries invariably his burthen on his head, experience has taught the Indian that by doing so he would not be able to make much progress through the thick woods, and his load is therefore slung on his back; for that purpose they have baskets which are made of the stems of a calathia, or of some species of palm.

Our preparations had been completed, the loads distributed according to the appearance of strength possessed by our carriers; and after Mr. Glascott had left with his party, in a boat which was hired for the purpose, we commenced our march overland on the 8th of July. The forest through which we now proceeded appeared to have less underwood; and I observed numerous specimens of that valuable tree the siruaballia, which affords one of the best timbers for the planking of vessels and the construction of gigs, boats,

&c. I saw trees of this description, of which the trunks might have measured seventy feet before they branched off.

The cedar and other forest trees, many of them of the most gigantic dimensions, were seen in great numbers during the course of this day's journey, besides numerous *hya-hya* trees. The *hya-hya* is the remarkable tree which yields by incision a milky fluid that forms a good substitute for cow's milk. The Indian, to whom it is inexplicable how man can make use of milk after having been weaned from the maternal breast, does not attach any value to this fluid as an article of food, but the younger community prepare from it balls of caoutchouc.

Our path led over hillocks from fifty to sixty feet high, extending in longitudinal ridges: their intermediate valleys generally formed swamps, on crossing which we frequently sunk to our girths in mud and water. After four hours' march we crossed the Caruawa, here a mere rivulet; and arrived in the afternoon at a small settlement consisting of two houses inhabited by Waikas.

The neatness and order of the provision-fields around these settlements showed that the Indian who presided over them was distinguished from the generality of his brethren. Paths led through the fields; the yams were trailed against poles; lime and orange trees, so seldom to be met with amongst the Indians, increased the favourable idea I had of the inhabitants. We found only one Indian and some females at home; the rest, with their chieftain, were gone to work for a time at a wood-cutting establishment on the river Pomeroun with a view to earn money to procure those articles which have become almost necessaries of life with them, namely, wearing apparel, implements for cultivating their fields, guns, powder and shot.

Leaving Paripu we continued our march; and in the afternoon of the same day arrived at another large settlement, judging at least from the number of the huts. Here also the male inhabitants were absent, having gone to work at the Pomeroun.

We departed from Cariacu on the 11th of July. The Barama resembles much the Upper Barima; its banks are clothed with a similar vegetation, and it is equally serpentine in its course. I noticed a good deal of potter's clay, used by the Caribisi for the manufacture of pottery, which for its durability is highly esteemed by the colonists. This clay has a grayish colour, and is mixed with the loose materials of decomposing granite.

The rivulet Nakuwai was the largest tributary which we passed in the course of our first day's ascent; it joins the Barama on its left bank. We noticed the first rocks lying in the river's bed above the rivulet Abocotté. About a mile and a half above this, the Erawanta and Mazuwini join the Barama close to each other. During the rainy season, when the bed of the river is full, it forms numerous off-flows, which adopt a more direct course than the river itself, and join it again at some distance. The Indians who are acquainted with these branches navigate them, and thus shorten the ascent materially.

We passed, on the afternoon of the 13th of July, some hillocks, and, soon after, the first rapid, formed by dikes of granite; and reached a settlement of Waikas, called Cadui, which we were told was the last inhabited place below the great fall. We were here struck with an air of plenty: the cassava grounds were extensive; yams, sweet potatoes, plantains, and bananas were abundant; also the paripi palm, and papayas, of which the fruit resembled a large melon, some of them measuring twenty-eight inches in circumference. Sugar-cane, cashew, and cotton-trees grew around the huts. A number of wild fowls was observed; moridies, powies, parrots of all plumage; several sun-birds, all tame, and associating amicably with one another.

I succeeded in procuring a set of circum-meridian altitudes, according to which the settlement was in $7^{\circ} 19'$ N. latitude. We heard quite distinctly during night the roaring of the great fall Dowocaima, which is about two miles distant, and bears S. 58° W.

Having engaged three more Indians to accompany us from Cadui to the Cuyuni, we started next morning at an early hour; and after passing some rapids, approached the great fall. We had to unload near the island Wayaruima, and carry the canoes and luggage two miles overland.

These cataracts surpass in grandeur the great falls of the river Demerara, to which in their structure they bear some resemblance. The whole fall on the Barama amounts to about 120 feet in a distance of two miles; but, from the sinuosities of the channel, there is no one point which affords a *coup-d'œil*.

The grandest scene is offered by the three upper falls, where the river, narrowing into about eighty feet, rushes turbulently down the precipice in three jets, and forms, in the distance of about 100 yards, a fall of thirty-five to forty feet perpendicular. This part is called Dowocaima, and as we saw it at the height of the rainy season, when the river is full to overflowing, the scene is sublime indeed. The banks were bordered by a primitive forest, and foliage of every hue, among which the bright red of the young mora-leaves formed a striking object. Lianes, reaching from boughs sixty feet high down to the water's edge; a thousand creepers, so closely enveloping whole rows of trees as to give them a fanciful resemblance to old massy columns crowned with ivy; white festoons and clusters of purple and yellow salver-shaped flowers trailing from tree to tree; all combined to form a vivid picture of tropical vegetation. The uproar of the masses of water which rush over the ledges of rock, and envelope in foam the surrounding scenery, added to the characteristic features of the landscape.

The ledges of rock are composed of gneiss, their stratification being S. 33° W.; they form an impediment to all further navigation, and are such as, if a denser population should render the step necessary, could only be overcome by canals or railroads. In the absence of these, our Indians took their light bark canoes on their heads, and carried them to that part of the river where there were no serious obstacles to its further navigation.

We passed next day the rapid Massiwinidui, and several others of less consequence, and encamped in the evening at the foot of the fall Aunama, from whence the path leads to the Cuyuni. The river Aunama joins the Barama just below the fall.

Our course on the 17th of July continued W.S.W. We crossed, at ten o'clock in the morning, the Aunama for the last time; and having passed a ridge of small hills which stretched S. by W., we stood soon after on the western branch of the rivulet Acarabisi. We had now reached the most elevated spot between the Cuyuni and Barama, and entered another system of rivers, the waters of which, instead of flowing northwards to the Waini and Barama, run to the S.; and, uniting with the Cuyuni, are conveyed to the Atlantic by the Essequibo.

From this ridge of hills the ground slopes southward to the banks of the Cuyuni; and I estimated the highest ridge which separates the two systems at 520 feet above the level of the sea. Heights which really deserve the name of mountains commence twenty miles further westward. The Aunama and Acarabisi are only divided from each other by hillocks which rise not more than from sixty to 100 feet above their level. Both rivers, if properly cleared of trees which have fallen across, would be navigable for canoes and punts; and as the portage is not more than two miles, these rivers present the means of connecting the Pomeroon and Morocco coast with the Upper Cuyuni, where the channel of that river is comparatively unobstructed.

We followed the valley of the Acarabisi, by no means a comfortable path, as at this season of the year it formed an almost continued swamp, and we fell sometimes to our girths in the mud. A rich retentive soil renders these regions peculiarly fit for the cultivation of rice. It rained almost incessantly, and we were truly rejoiced when, on the morning of the 19th of July, we arrived at the Caribisi settlement Haiowa, about two miles distant from the left bank of the Cuyuni. The country between the Barama and the Cuyuni is a series of narrow valleys, situated between hillocks of no great height. The principal valleys are those which are drained by the rivers Aunama and Acarabisi. The general direction of the others is at an oblique angle to these, and they vary considerably in extent. Sometimes they are merely defiles, and the greater number of them do not expand more than about a quarter of a mile. I am fully persuaded that there can be no soil better qualified for the cultivation of coffee than what is found here. The zones of granite, sometimes in spherical blocks, and the vitrified and ferruginous masses of clay which I frequently observed traversing the mountains, are favourable to the cultivation of that plant.

The productiveness of the soil nearer to the banks of the Cuyuni is evident from the specimens of sugar-cane, cotton, and plantains which were brought to me while at Haiowa. I saw a cane measuring 15 feet long, and $7\frac{1}{2}$ inches in circumference. The cotton, too, was of excellent quality and staple; and the few tobacco-plants

which the Indians raised for their own use were remarkable for their large leaves, and, as I was assured, for their fine flavour.

We expected to meet here a party which was to have been sent with a supply of provisions up the Cuyuni, for our stores had long since been given out, and we were reduced to cassava bread and what game chance brought to our hands. We were, however, disappointed in our expectations; and, in the absence of any craft, I had to send my coxswain a journey of two days higher up the Cuyuni, where I was told there was a corial large enough for our use. He arrived, and having bargained for the corial, returned, with some additional guides, on the morning of the 22nd of July. We embarked our baggage, and a few hours later began the descent of the Cuyuni.

The Cuyuni presented, where we embarked, a magnificent sheet of water. I estimated its width at from 400 to 500 yards. Its current was rapid, perhaps $3\frac{1}{2}$ miles in an hour, and its bed full to overflowing. A small chain of hills, called Macapa, bore nearly W. They are distant about a mile.

Our progress was rapid, and in the afternoon we had safely passed the dangerous fall of Kanaima, and rested at an abandoned settlement on the river's right bank. There were some other settlements in the neighbourhood, the inhabitants of which came to visit us. We did not observe any mora-trees along the banks; they were replaced by another equally majestic tree which the Indians called Tá-au. The islands with which the river was studded were almost covered with bushes of the *Quassia amara* or bitter-ash. The stream itself continued as if cut up by a multitude of large channels, which are not seen from each other, thickly-wooded islands intervening; and no accurate idea can be formed of their total breadth: sometimes a little range of densely-wooded hillocks approached the water's edge.

We passed the Otomong hills, and avoided by narrow passages between islands numerous large cataracts, which in our small canoes it would have been dangerous to attempt to descend. At the cataract of Poinka-marka, or Womuipong of the Caribisi, we had to unload and draw the canoes over a portage of about 300 yards' extent. The perpendicular fall of this cataract is not less than thirty feet, and it is generally called the *Canoe-Wrecker*, in consequence of many fatal accidents which have occurred here.

The rapids and falls now became less frequent, and still-water commenced. The tract of granite and gneiss which causes these impediments extends therefore from the Arakuna hills, uninterrupted, to the small range of hillocks called Macapa. It is about fifty to sixty miles in length, and constitutes the second large series of falls.

We had anxiously looked forward to meet the party which we expected with supplies of provisions. We heard of them today at a settlement opposite the Toro hills, but only to have the disappointment of learning, that on ascending the previous day the dangerous fall Wakupang, they had lost everything, and saved only their lives and the corial. Among the luggage lost was one of the instruments,

Massey's log, and a new tarpauling. Thus disappointed in our hopes of meeting comfort, we had to put up for some days longer with our scanty fare. We paid off our guides who had accompanied us from Haiowa, as, with the men who had come up from the Esse-qui-bo, our crew was sufficiently strong to reach that river.

The dangerous fall Wakupang, where our stores were lost on the preceding day, was passed without accident. This is the commencement of the second series of rapids or falls. The river is studded with islands; green-heart and purple-heart, both most valuable trees, become abundant along its banks; but the impediments which the numerous rapids throw in the way will for some time render these treasures unavailable.

We passed in the afternoon the Cutuau hills, along which a river of the same name has its course. The Cutuau offers a communication with the river Waini, and is much frequented by the Indians of both rivers; eight miles further eastward is the rivulet Wayarimpo, whence another path leads to the Paruni.

We reached on that evening Ematuba, generally called "the Great Fall," where we had to unload and haul our corials over land, and encamped at the foot of the small island whither the corials had been drawn. Continued rains precluded the possibility of any observations, and we started on the morning of July 27th, under the same unfavourable weather. An hour and a half after, we were at the foot of the last fall, called Akayu, and saw before us the junction of the three rivers, Essequi-bo, Mazaruni, and Cuyuni.

Our party left Bartika Grove on the 28th of July in two corials, and we arrived safely in George-town on the second day ensuing, after an absence of three months and a half, during which period we had travelled upwards of 700 miles; and although that period presented but a continuation of the most unfavourable weather, we nevertheless determined *twenty-one* points astronomically, and acquired a correct knowledge of the course of the rivers Waini, Barima, Amacura, Barama, and Cuyuni, all of which had never been visited before by any person competent to delineate them in a map; no wonder therefore that their actual course should be almost opposite to what it is represented in extant maps.

The fertility of the tract we have explored has been pointed out in various places in this as well as my former account. The lands adjacent to the rivers Amacura, Barima, and Barama, and beyond the reach of the tides, are superior in quality to those of any other district hitherto visited; and this refers equally to the Cuyuni, where I met sugar-canes of the finest description, and native cottons of superior staple and quality. But the impediments to the navigation of the Cuyuni will, I fear, prove a great obstacle in the way of rendering the fertility of its banks available. The Amacura, Barima, and Waini are for a great distance free from such impediments, and a denser population only is wanted to render this part of Guiana one of the most productive throughout its whole extent; and to this end the numerous natural canals and connexions between its chief rivers would materially contribute.

These tracts are at present inhabited by the following tribes:—
 1. Warrans, along the coast, from Pomeroon to the Amacura; 2. Arawaaks, intermixed with the former, chiefly at the rivers Waini, Barima, and Amacura; 3. Waikas and Chaymas, sister tribes of the Wacawais, at the upper course of these rivers, and the regions between the Barama and Cuyuni. I estimate the whole number of these nations at 2500. Many of them assist in felling timber or in working on the estates; and if the system which only of late years has been followed, namely, that of treating the Indian as a rational being, in giving him a fair remuneration for his work, shall be generally adopted, the aborigines, there is no doubt, will prove most useful labourers to the colony. It is my full persuasion, that if the attention and paternal provisions which the aborigines of Guiana have of late years enjoyed at the hands of Her Majesty's Government be continued, and means adopted to afford them religious instruction, a relic of the once numerous Indian population may yet be rescued.

BIBLIOGRAPHICAL NOTICES.

Die Pflanze im Momente der Thierwerdung. Beobachtet von Dr. F. Unger. Wien, 1843, pp. 100, with a large quarto plate.

THE observations which Dr. Unger made many years since on the peculiar motion of the spores of *Vaucheria clavata*, though questioned by many, have for the most part been received as correct and well-founded. Indeed they have been confirmed more or less by Treviranus, Meyen, Trentepohl, Valentin and others, and the fact is undoubtedly one of the most curious amongst those which have been recorded of apparently spontaneous motion amongst the reproductive organs of Algæ. No one seems hitherto to have ascertained how this motion is produced, with the exception of Dr. Unger, who in the treatise before us has fully described the structure of the cuticle of the spores, which it appears is clothed with short vibratory processes, exactly as in many of the inferior animals, or particular organs or membranes of those of a higher grade. The fact of the existence of such processes in vegetables is not, however, perhaps altogether new to science. Pouchet has described something of the kind in the larger circulating globules in *Zannichellia*, though so imperfectly that the real nature of the processes is not very evident.

We now proceed to give the results of Unger's observations as detailed by himself at the end of his treatise, which we think cannot fail to interest our readers.

1. *Vaucheria clavata*, Ag. (*Ectosperma clavata*, Vauch.) is, considered respectively of all its peculiarities, a plant, which by the union of numerous individuals forms small tufts on the surface of stones in running streams, in the middle of Europe. It consists, when fully developed, of a branched inarticulate tube, 0037th of a Vienna inch in diameter, which continues to grow above, while the lower portions are dead or decomposed, and in this state lives from the end of winter